Space Weather Forecast

Issued on Saturday, 01 April 2023 at 00:23 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of both Minor Radio Blackouts and Minor Geomagnetic Storms easing today.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low over the past 24 hours, with generally only occasional small Common-class flares recorded. The peak flare of the period was a higher Common-class flare at 31/2057UTC, which looks to have originated over the southwestern limb, perhaps aided by a fairly simultaneous flare by the relatively unassuming small region on the southwest of the disc. No Earth directed Coronal Mass Ejections (CMEs) have been detected in available imagery.

Solar Wind / Geomagnetic Activity: The solar wind, as measured at L1 by ACE and DSCOVR, was characterised by the fast wind associated with coronal hole 88 to start the period with solar wind speeds elevated to strong at around 600-650km/s, with a peak speed of approximately 690km/s recorded around 31/0350 UTC. From around 31/1100 UTC solar winds have deceased to Slightly elevated levels as the fast winds associated with the coronal hole looks to be waning. The inter planetary magnetic field (IMF) was generally weak, with the important north-south component was mostly anti-aligned with Earth's field to greater geomagnetic effect. The result of the above solar wind measures was for Quiet to Active geomagnetic conditions.

Energetic Particles / Solar Radiation: High energy proton enhancement (greater than 10MeV) has been at background levels.

Four-Day Space Weather Forecast Summary

Solar Activity: An initial chance of further Moderate-class flares as the recent active sunspot in the southwest of the disk continues to rotate away around the southwestern solar horizon. The risk of further such events should then sharply decline with generally Low solar activity expected, with an uncertain degree of compensation possible from arriving eastern solar horizon regions, particularly later into the period. These regions will be assessed as and when they present for analysis.

Solar Wind / Geomagnetic Activity: A re-analysis of a portion of the 29 March prominence eruption from the southeastern limb now presents a Slight Chance of glancing incidence later in Day 2 (2nd), although the deterministic MOSWOC Enlil run has a miss. This is the only CME to feature in the forecast at present.The Earth looks to be exiting the fast wind associated with the recent coronal hole. This feature continues to have an effect however with a risk of Active and Minor Geomagnetic Storm G1 conditions persisting into Day 1. Largely Quiet conditions should establish through Day 2, although there remains a Slight Chance of G1 should the 29 April CME glance Earth possibly later in the day. Later Day 3 and into Day 4 Earth will likely begin to see the effect of approaching coronal holes, these bringing a Chance of Minor Geomagnetic Storm G1 conditions once again.

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Energetic Particles / Solar Radiation: Solar radiation carries a slight chance of breaching S1 given the history of the recent large sunspot rotating away around the southwest solar horizon through Day 1, thereafter risk returning towards background into the forecast period pending any further developments.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	30	10	20	30
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	10	5	5	10
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	1	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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